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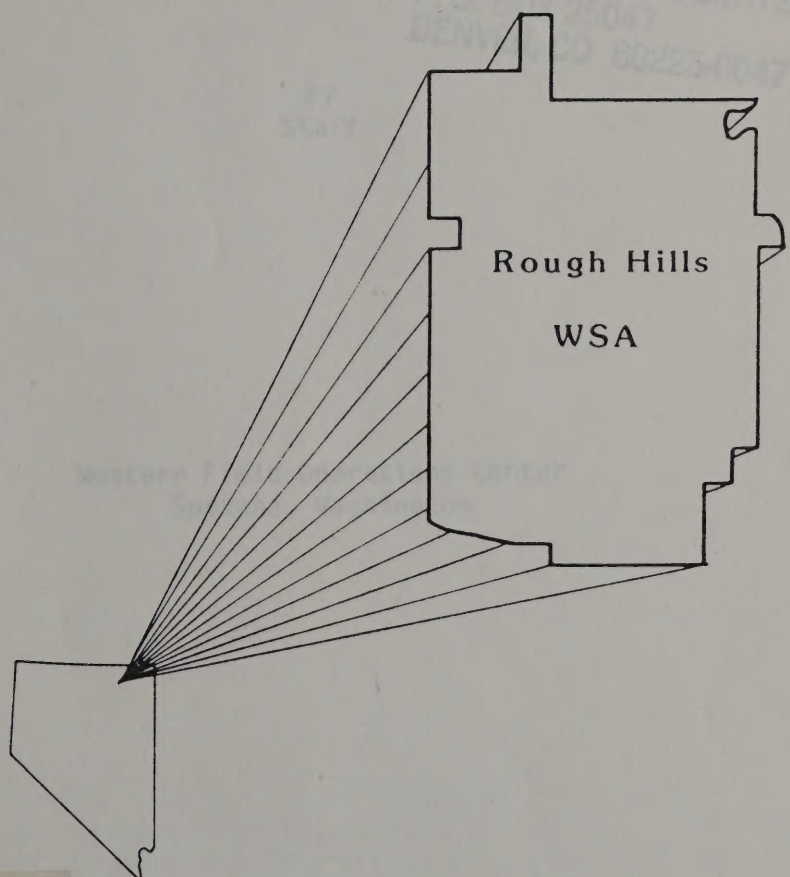
Mineral Resources of the Rough Hills Wilderness Study Area, Elko County, Nevada



BUREAU OF MINES

UNITED STATES DEPARTMENT OF THE INTERIOR

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MINERAL RESOURCES OF THE ROUGH HILLS WILDERNESS STUDY AREA, ELKO COUNTY, NEVADA

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By
Staff

Western Field Operations Center
Spokane, Washington

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

PREFACE

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered land designated as Wilderness Study Areas ". . . to determine the mineral values, if any, that may be present . . . ." Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of the Rough Hills Wilderness Study Area (NV-010-151), Elko County, NV.

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, WA, 99202. The report has been edited by members of the Branch of Mineral Land Assessment at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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SUMMARY

A mineral survey of the Rough Hills WSA (Wilderness Study Area) in northeastern Nevada was done by the U.S. Bureau of Mines in 1985 at the request of the Bureau of Land Management. The WSA is comprised of 6,685 acres of mountainous, desert lands within the Elko District of the Bureau of Land Management. The survey entailed investigations of prospects or mineral occurrences to provide information on possible resources within the WSA.

No mineral resources were identified in the WSA. The only historical mining activity was for placer gold at the Prunty prospect at the confluence of Copper Creek and the Bruneau River. Total gravel at the prospect is about 6,500 cubic yards; however, the survey showed significant gold values (greater than $0.10 gold per cubic yard) only in the southwestern portion. There, however, the gravel averaged less than $1.00 gold per cubic yard, and only about 3,000 cubic yards are present, a grade and yardage insufficient to be of commercial interest. The occurrence, however, may have value for recreational mining by hobbyists.

The source of the placer gold at the Prunty prospect is uncertain because placer gold was found in trace amounts along both Copper Creek and the Bruneau River. It is suspected, however, that most of the gold at the prospect was transported there by Copper Creek from the Charleston mining district which adjoins the WSA to the east. Apparently, the physical conditions necessary to significantly concentrate the gold occurred only at the confluence of the creek with the river.

Besides the Charleston mining district, two other districts are nearby; the Island Mountain district is 1 mile west of the WSA, and the Alder district is 5 miles northwest. The three districts have produced gold from placer deposits; gold, silver, copper, lead, antimony, tungsten, and minor zinc from quartz veins; tungsten from tactite deposits; and barite from a stratiform deposit. In addition, there is anomalous, disseminated gold at an isolated prospect, the Golden Empire, about 1.5 miles southwest of the WSA. Similar mineral occurrences, except for placer gold at the Prunty prospect, are not known within the WSA. Small-scale mining and some exploration, primarily for gold, continues in the three districts and in the surrounding area.

There are no oil or gas leases or lease applications in the WSA. Sand and gravel occurrences suitable for construction purposes occur in the WSA but cannot compete with sources closer to markets.

INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) portion of a cooperative study with the USGS (U.S. Geological Survey) to evaluate mineral resources and potential of the Rough Hills WSA 1/ (Wilderness Study Area) at the request of the BLM (U.S. Bureau of Land Management). The USBM examines individual mines, prospects, claims, and mineralized zones, and evaluates identified mineral and energy resources. The USGS evaluates potential for undiscovered resources based on areal geological, geochemical, and geophysical surveys. Results of the investigations will be used to help determine the suitability of the WSA for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

Setting

The Rough Hills WSA is in northeastern Nevada about 60 mi (miles) north of Elko (fig. 1). It includes 6,685 acres of mountainous, desert lands administered by the BLM (Elko district). The WSA is surrounded by private ranches and other BLM land, except on the northern boundary where it adjoins the Humboldt National Forest (fig. 2).

Access is from the Charleston-Jarbidge Road 2/ (improved gravel) to within 4 mi of the southeastern corner of the WSA (fig. 2). From there, ranch roads skirt the southern, western, and northeastern boundaries of the WSA. From the ranch roads, jeep trails penetrate or pass near the southeastern, southwestern, and northwestern portions of the WSA.

1/ A WSA is a roadless area or island that has been inventoried by the U.S. Bureau of Land Management and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act and Section 2(c) of the Wilderness Act of 1964, (78 Stat. 891).

2/ Charleston, located about 1.5 mi east of the WSA (fig. 2), is the site of a small mining town dating from the 1870's (Smith, 1976, p. 36). Little evidence of the town remains. Jarbidge, about 22 mi north of Charleston, is also an old mining town dating from about 1909.

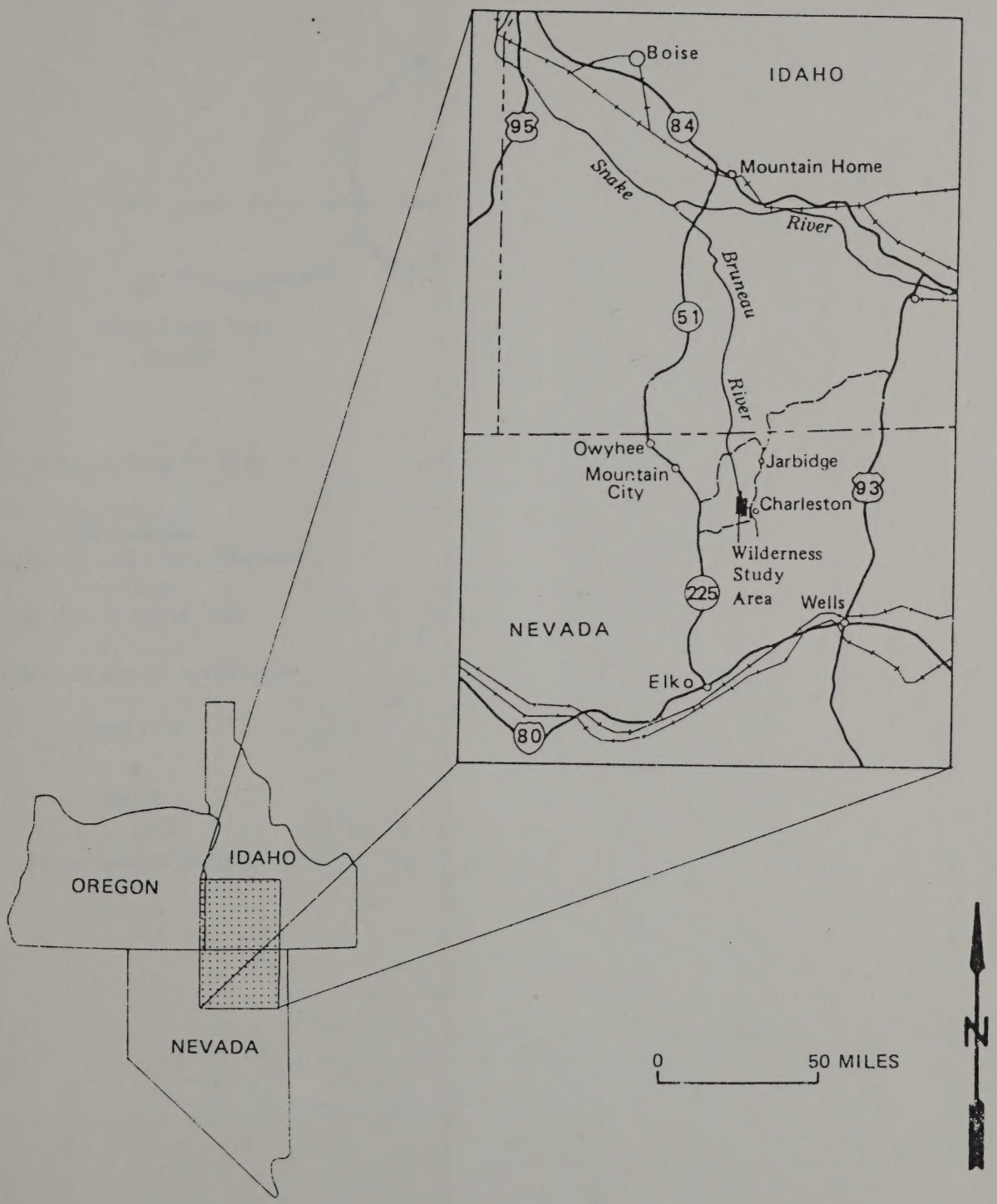

FIGURE 1. – Location of the Rough Hills Wilderness Study Area (NV-010-151), Elko County, NV

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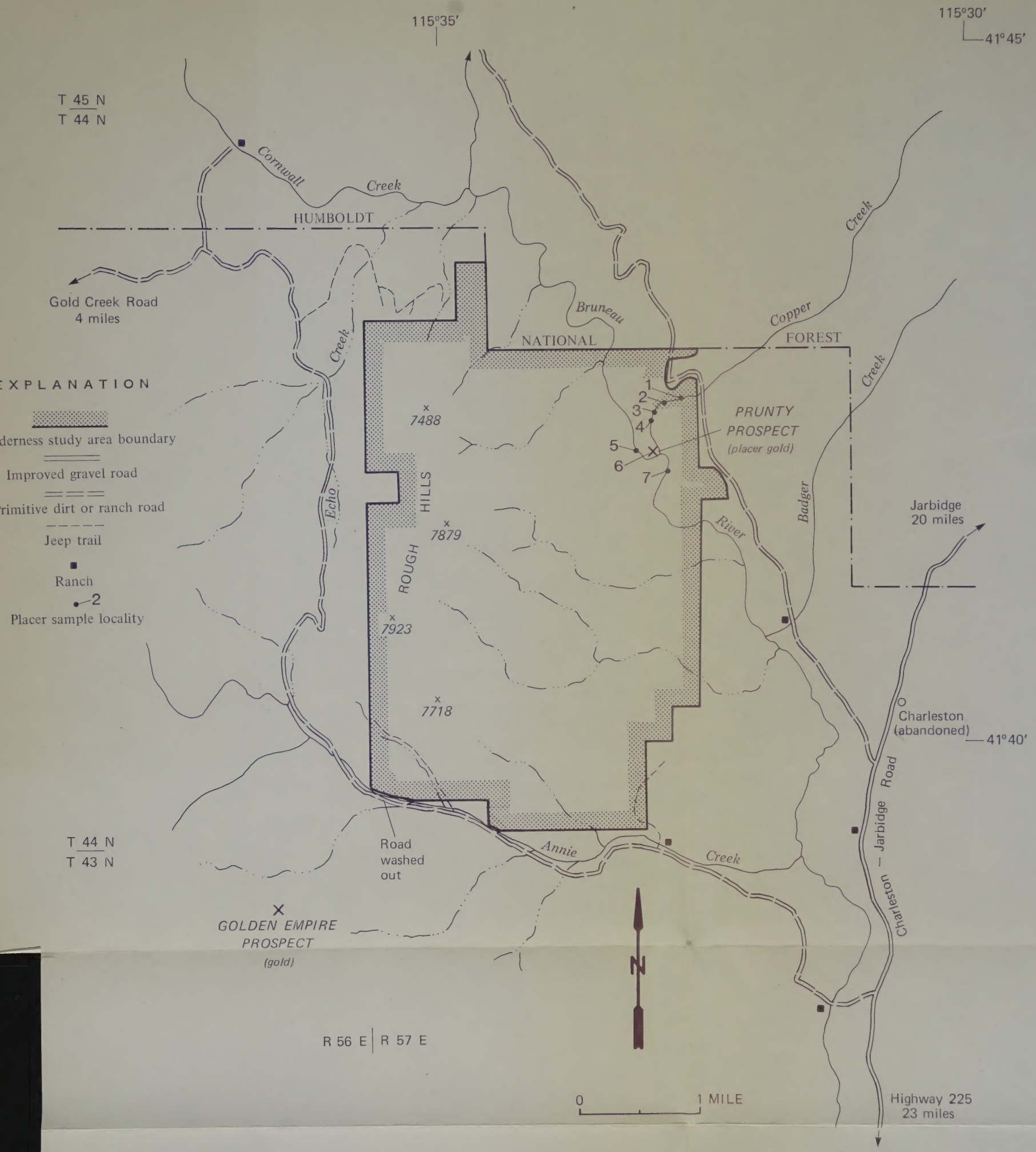
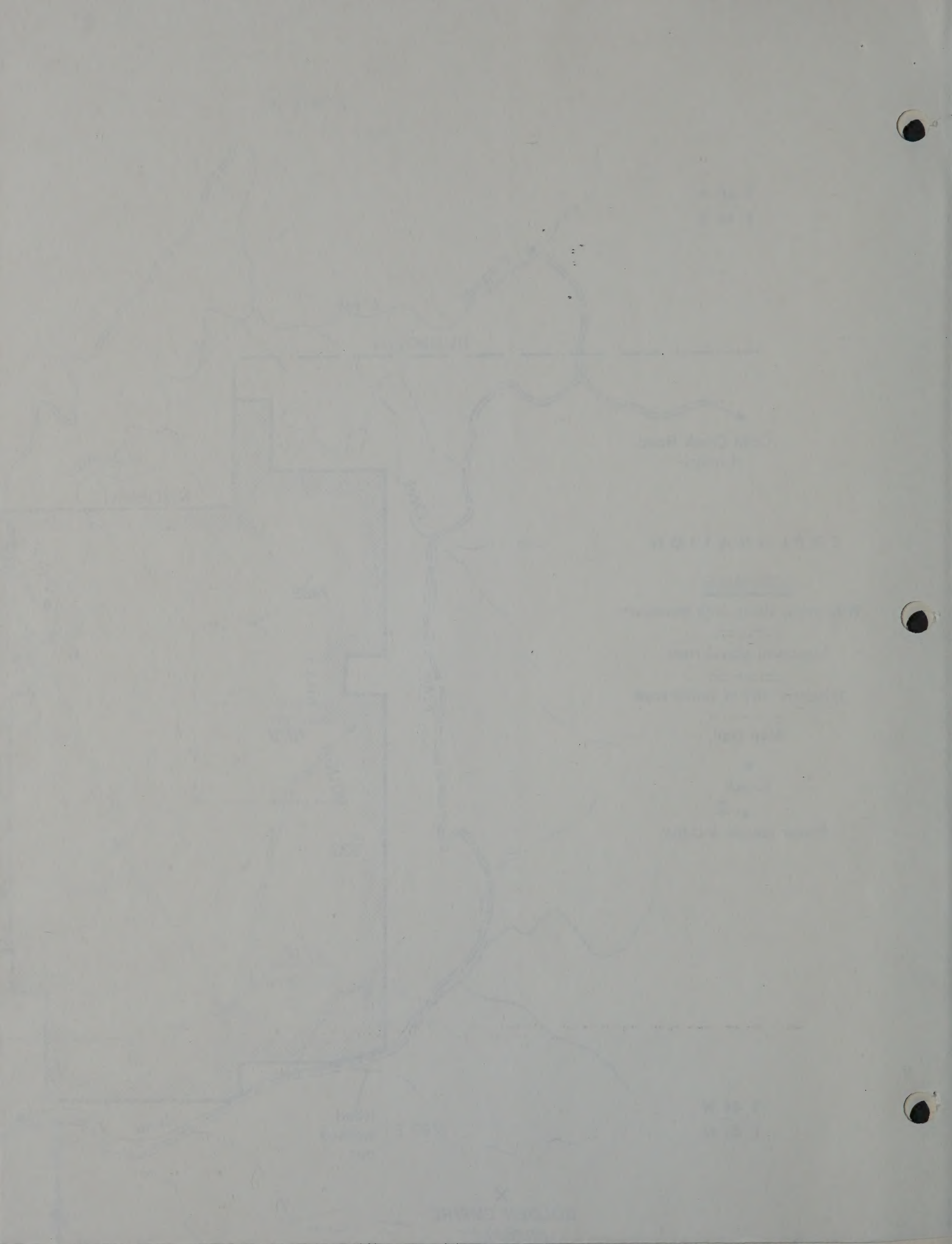


FIGURE 2. – Placer sample localities in the Rough Hills Wilderness Study Area (NV-010-151), Elko County, NV



The WSA encompasses most of the Rough Hills, a rugged, mostly treeless, north-trending mountain range about 6 mi long and 3 mi wide. The Hills area is drained by the northwest-flowing Bruneau River and its tributaries. To the southeast, the river meanders across a broad floodplain valley that bounds the WSA. In the northeastern portion, the river flows through a steep, narrow canyon 200 to 400 ft (feet) deep. There, it is joined by the southwest-flowing Copper Creek. The highest point in the WSA is at a pyramid-shaped peak, 7,923 ft, near the western boundary (fig. 2). The lowest point, about 5,870 ft, is on the Bruneau River where it exits the WSA at the northern boundary.

Previous Studies

Regional geological studies are by Coash (1967) and Hope and Coats (1976). A study of the geology, energy, and mineral (GEM) resources is by Mathews and Blackburn (1983), and a reconnaissance geochemical survey is by Quade and Tingley (1984). Descriptions of nearby mining districts is by Smith (1976).

Present Study

Mining-related data was gathered from the libraries and records of the USBM, BLM, state, county, and other government and private sources. During the field study in 1985, a prospect indicated by the prefield study to be within the WSA was examined. In addition, ground and air reconnaissance was performed for evidence of mineralization or unrecorded mining-related activity.

Eighteen placer samples were collected. The samples were either: 1) reconnaissance - samples of sand and gravel, generally one level 14-in (inch) panful partially concentrated on site to check for gold or other heavy minerals, or 2) channel - samples taken continuously down a cleaned, nearly vertical bank or pit wall, generally 1 cubic foot of sand and gravel per foot of depth, and partially concentrated by panning.

Field concentrates of placer samples were further concentrated in a laboratory on a Wilfley table. Resulting laboratory concentrates were scanned with a binocular microscope to determine type and amount of heavy minerals present. All gold detected was in fine particles and was recovered by amalgamation. Concentrates were also checked for radioactivity and fluorescence. Results of analyses are available from the Western Field Operations Center, E. 360 Third Ave., Spokane, WA 99202.

ACKNOWLEDGEMENTS

The authors are grateful to Frank Prunty and other members of the Prunty family, and Fred Betia and his wife for providing historical and access information, and for their many courtesies. Steve Brooks, Elko BLM district geologist, provided aerial photos, BLM maps, unpublished geological information, and other data. Terry Close, Andrew Leszcykowski, Rich Rains, and Dick Winters of the USBM provided valuable assistance during the field study.

GEOLOGIC SETTING

The WSA is within the Basin and Range geologic province characterized by north-trending fault-block mountains separated by parallel intermontane valleys. The WSA encompasses most of the Rough Hills, a rugged mountain range about 6 mi long and 3 mi wide. The Hills are primarily comprised of Tertiary-age rhyolitic flows, domes, and ignimbrites, except for a small area of faulted Triassic-age marine sedimentary rocks in the extreme southwestern portion (Hope, 1976, sheets 2 and 6). The southeastern and northeastern slopes of the Hills are lapped by Tertiary gravel, and the western and southwestern slopes are covered by extensive landslides.

MINING HISTORY

The WSA has no history of mining other than minor, unrecorded production of placer gold from the Prunty prospect at the confluence of Copper Creek and the Bruneau River. Local residents reportedly recovered about 2 oz (troy ounces) of gold during the depression years of the 1930's, and in 1981 other local residents did exploration work at the prospect (Frank Prunty, 1985, personal communications). However, no records were found indicating the prospect has ever been claimed.

The source of gold at the Prunty prospect is uncertain. Traces of gold were found elsewhere in sand and gravel deposits along both Copper Creek and the Bruneau River; however, most of the gold at the deposit was probably transported there by Copper Creek from the Charleston mining district to the east. There are no indications of vein or other type gold deposits in any rocks in the WSA that could have been the source of the placer gold.

The Charleston mining district is adjacent to the eastern boundary of the WSA (Quade, 1984, p. 12). Two other mining districts, the Island Mountain to the west and the Alder to the northwest extend to within 1 mi and 5 mi, respectively, of the WSA. The first discoveries were made in the districts in the 1860's and 1870's. Since then, each district has produced gold from placer deposits; gold, silver, copper, lead, antimony, tungsten, and minor zinc from quartz veins within pre-Tertiary sedimentary rocks cut by intrusives; and tungsten from tactite deposits (Smith, 1976, p. 19-21, 35-38, and 85-89). Some of the vein deposits apparently contain fairly high precious metal values but none are of large size. Bismuth, uranium, and molybdenum minerals also occur in some of the deposits; however, the produced value of these metals was probably nil.

There continues to be mining interest in the region. Several small mines in the three districts are producing or being explored for gold and silver in vein deposits, and some barite has been produced from a stratiform deposit in the Charleston district (unpublished BLM data). Exploration for disseminated gold deposits has occurred in the three districts and at the isolated Golden Empire prospect, 1.5 mi southwest of the WSA (fig. 2).

APPRAISAL OF MINERAL RESOURCES

No mineral resources were identified within the WSA.

Sand and gravel at the Prunty prospect and along Copper Creek and the Bruneau River were sampled for placer gold and other heavy minerals (fig. 2). The data are summarized in table 1.

The Prunty placer prospect contains a perched bed of gold-bearing gravel that covers about an acre and averages about 4 ft thick. This implies about 6,500 yd^3 (cubic yards) of gravel; however, significant values 3/ were found only in samples taken in the southwestern portion of the occurrence. There, the gravel averages less than \$1.00 gold/yd^3 and only about 3,000 yd^3 are present. This grade and volume of gravel is insufficient to be minable by large volume commercial methods. These methods require gold values of several dollars per cubic yard and volumes of several thousand cubic yards of gravel treated per day. However, the occurrence may have value for recreational mining by hobbyists.

No other mineral occurrences are known within the WSA except sand and gravel suitable for construction purposes. These occurrences cannot compete with larger deposits closer to markets. There are no oil or gas leases or lease applications within the WSA.

3/ Significant values are defined as greater than \$0.10 gold/yd^3, calculated using a gold price of \$425/oz. Values of \$0.10 or less gold/yd^3 are reported as trace.

TABLE 1.--Descriptions and analytical results of placer samples from Copper Creek, the Prunty prospect, and the Bruneau River

Map no. (fig. 2)	Name	Summary	Workings and production	Sample data
1		Sand from plant roots	None.	One pan sample; no gold.
2		Pebbly gravel on bedrock.	None.	One pan sample; $0.02 gold/yd^3 1/.
3		Sandy gravel on bedrock.	None.	One pan sample; $0.10 gold/yd^3.
4		do----------	None	One pan sample; no gold.
5		Gravel on bedrock.	None.	One pan sample; no gold.
6	Prunty prospect.	Stream gravel a few inches to about 8 ft thick, covering about an acre, is perched 5 to 25 ft above the present stream level. The gravel is derived primarily from quartzite and rhyolitic volcanic rocks. Fine placer gold is concentrated just above or in fractures in the rhyolitic bedrock. Scattered stream gravel, 0 to about 2 ft thick, extends upslope above the workings for about 125 ft.	In the northeastern portion of the prospect, there are four pits up to 15 ft across and 6 ft deep. In the southwestern portion, there are three pits and two trenches up to 40 ft long and 5 ft deep. The trenches connect with an area about 100 ft long and 50 ft wide that has been sluiced to bedrock. It is estimated that about 450 yd^3 of gravel was processed from the workings. Local residents reported that about 2 oz of gold was recovered from the prospect during the 1930's.	A total of 12 placer samples were taken: On the slope above the workings, one pan and three channel samples of scattered stream gravels from at or near bedrock showed no significant gold. At or near the northeastern workings, two channel samples from a pit (not to bedrock) and two pan samples from bedrock showed nil to $0.05 gold/yd^3. At the southwest workings, a pan sample from a fracture in bedrock in the sluiced area showed $12.88 gold/yd^3. In an adjoining trench, a channel sample from the surface to 2.25 ft showed $0.57 gold/yd^3, another from 2.25 ft to 2.50 ft (to bedrock) showed $3.06 gold/yd^3, and a pan sample from a fracture in bedrock showed $0.54 gold/yd^3. The average grade of the three samples from the trench is about $0.85 gold/yd^3.
7		Slope wash and river gravel.	None.	One pan sample; $0.09 gold/yd^3.

1/ Gold at $425/oz.

APPRAISAL OF IDENTIFIED RESOURCES

By Staff, U.S. Bureau of Mines

Mining and Mineral Exploration History

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In recent years, there has been renewed mining interest in the region. Several small mines in the three districts are producing or being explored for gold and silver in vein deposits, and some barite has been produced from a stratiform deposit in the Charleston district (unpublished BLM data). Exploration for disseminated gold deposits has occurred in the three districts and at the isolated Golden Empire prospect, 1.5 mi southwest of the WSA (fig. 2).

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